

# California Water Plan Update 2013 - Groundwater Enhancement

## Deliverable 1 and 2: Compiling and Summarizing Groundwater Information

Groundwater Well Infrastructure

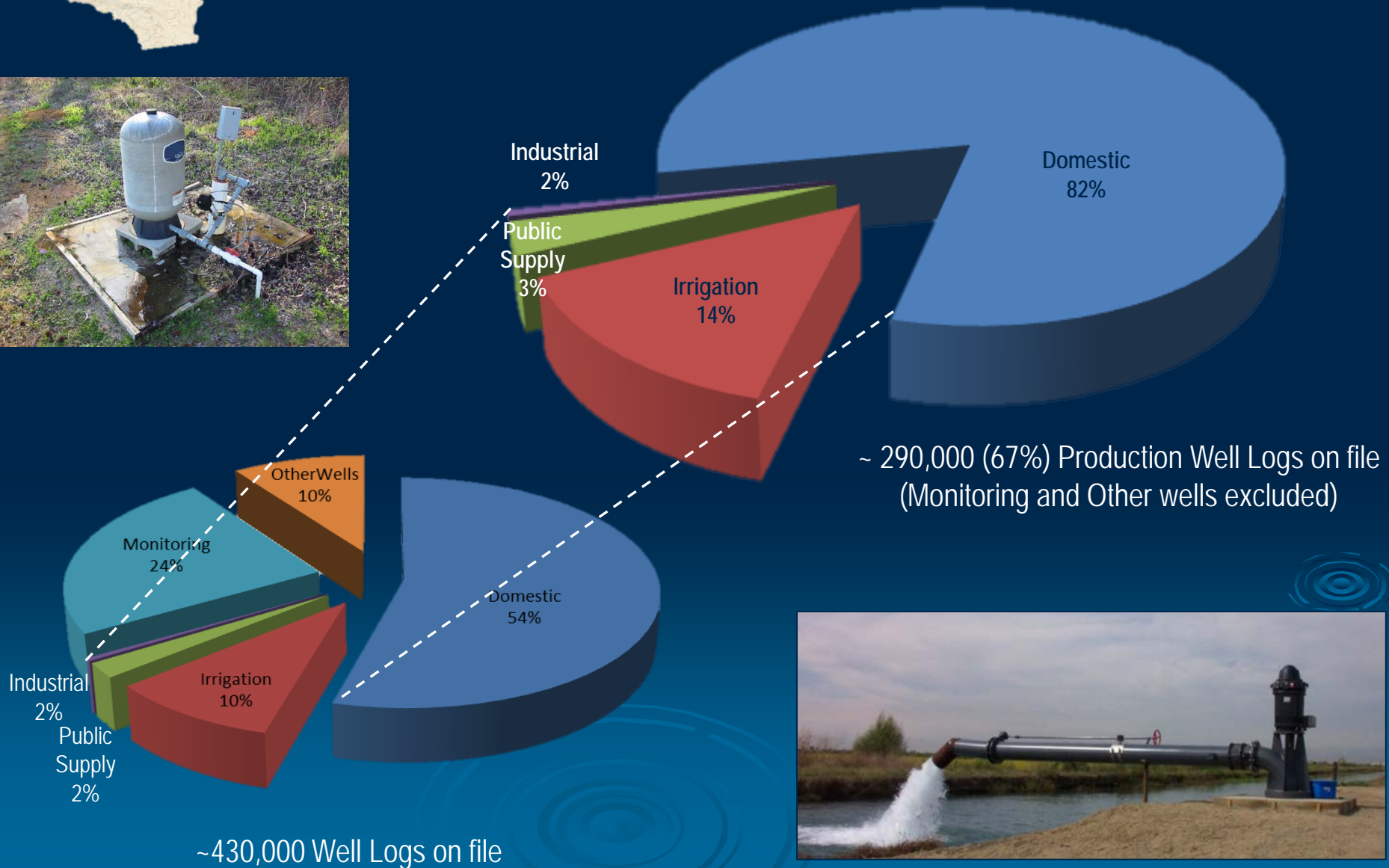
Groundwater Monitoring

Integrated Regional Water Management Plans

Groundwater Management Plans



# Wells Drilled in California by Well Use, 1977 to 2010



# Wells Drilled in California, 1977 to 2010

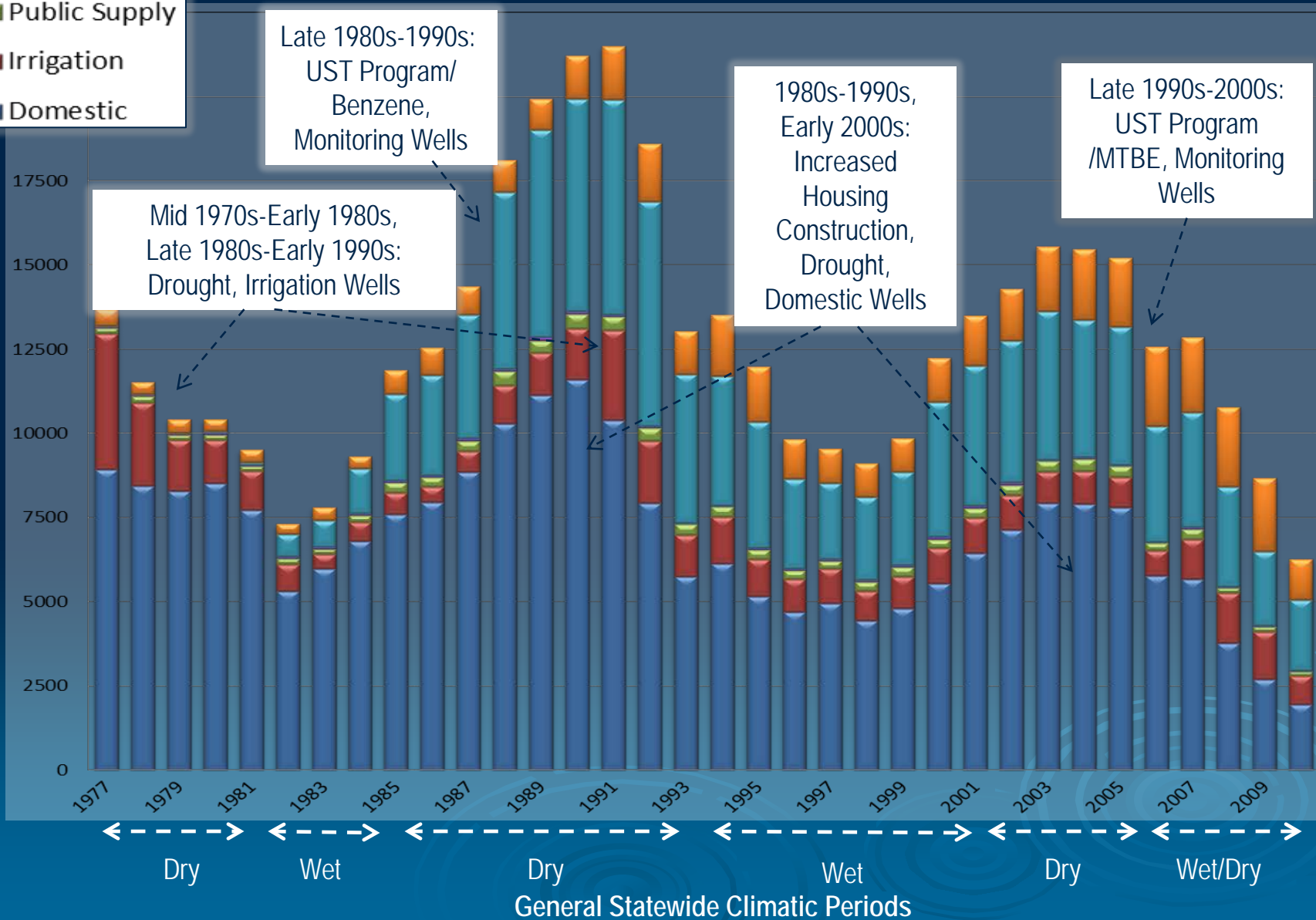


Late 1980s-1990s:  
UST Program/  
Benzene,  
Monitoring Wells

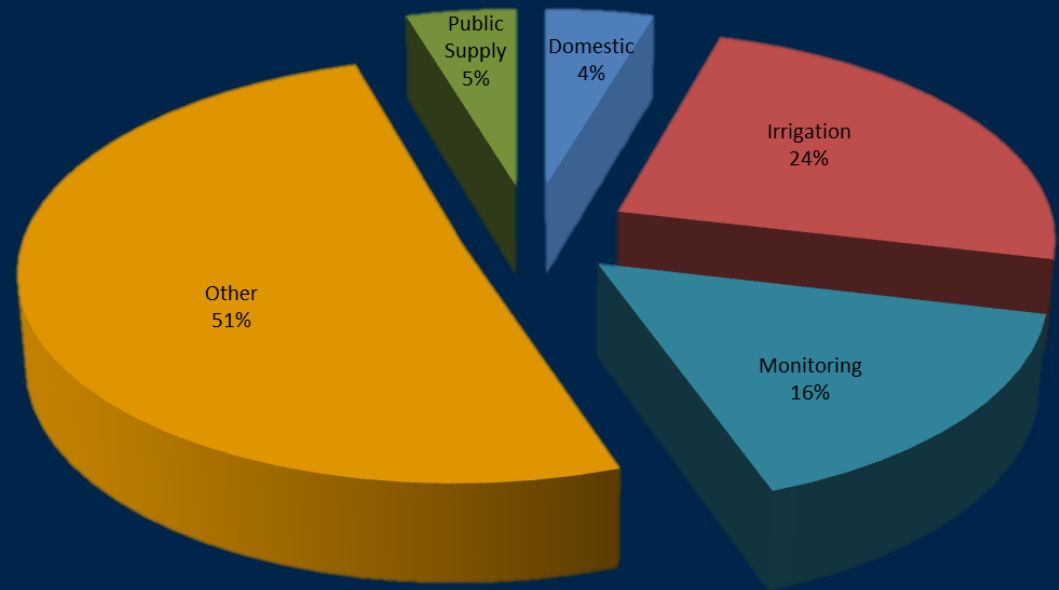
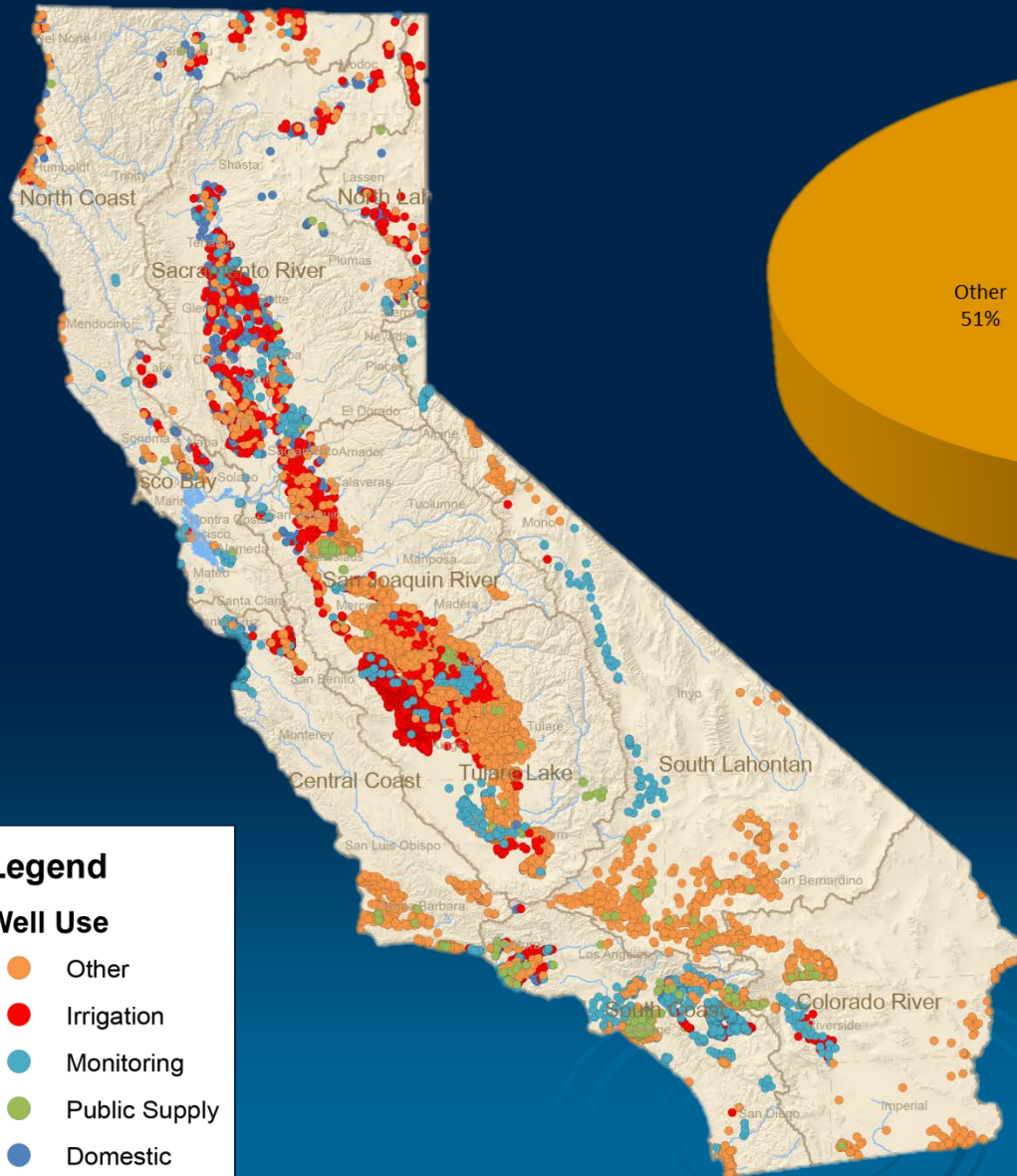
Mid 1970s-Early 1980s,  
Late 1980s-Early 1990s:  
Drought, Irrigation Wells

1980s-1990s,  
Early 2000s:  
Increased  
Housing  
Construction,  
Drought,  
Domestic Wells

Late 1990s-2000s:  
UST Program  
/MTBE, Monitoring  
Wells



# Groundwater Monitoring by Well Use, 1977 to 2010



~11,000 Monitoring Wells  
(DWR, CASGEM, USBR, USGS, & Cooperating Agencies)

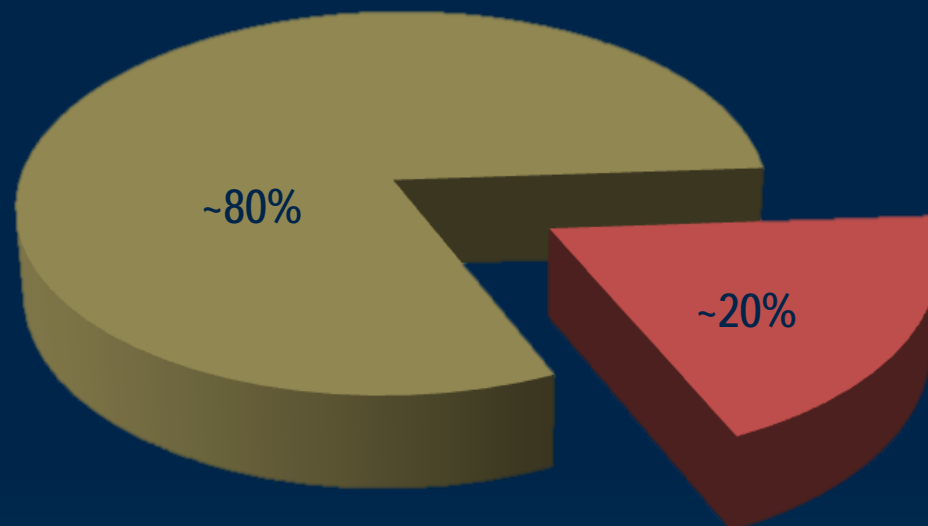
"Other" well use includes unused wells, wells of unknown well use (no well use listed on the Well Completion Report), or wells with no well log on record.



# Integrated Regional Water Management Plans and Groundwater Management



■ IRWMPs Reliant on GMPs to Manage Groundwater  
■ IRWMPs Managing Groundwater



Of the 31 Active IRWM Plans:

~80% are reliant on local Groundwater Management Plans to manage groundwater

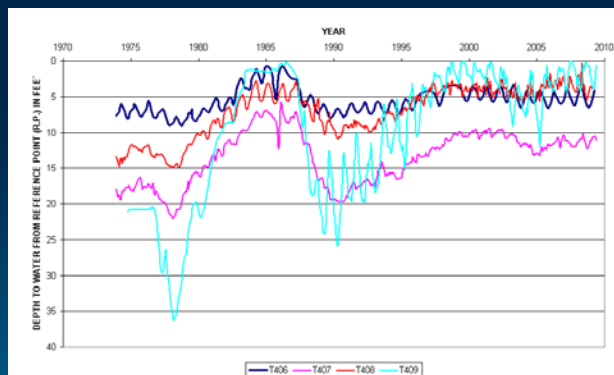
~20% take an active role in managing groundwater

# What are some of the IRWM Regions doing to Implement Groundwater Management?

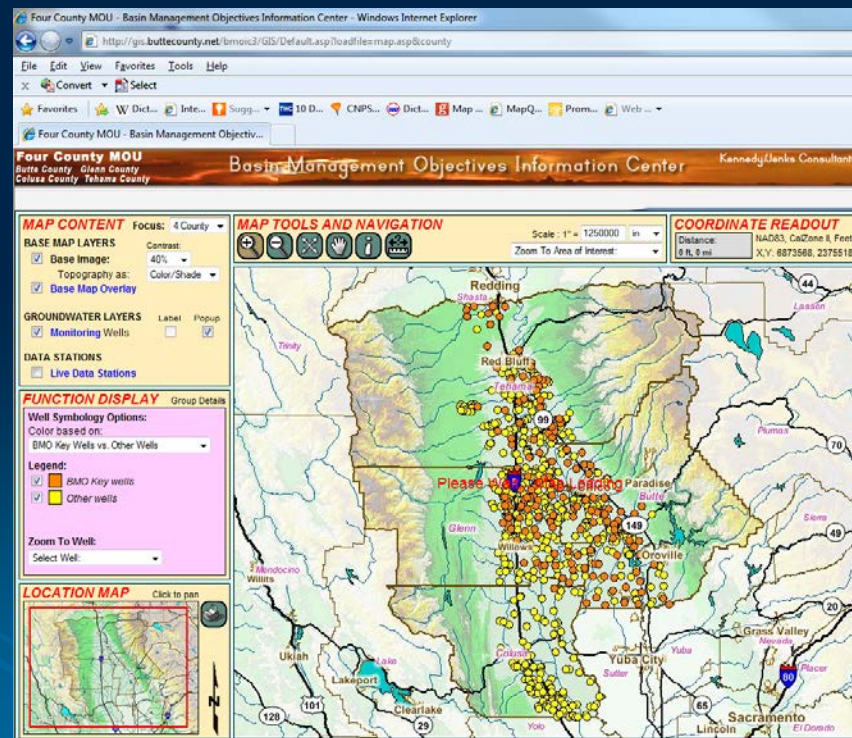
- Measure, compile, manage groundwater level databases, and disseminate groundwater level data
- Develop Basin Management Objectives for groundwater levels, groundwater quality, and inelastic subsidence using trigger levels



Measure  
Groundwater Levels



Multi-Completion Observation Well  
Groundwater Level Hydrograph



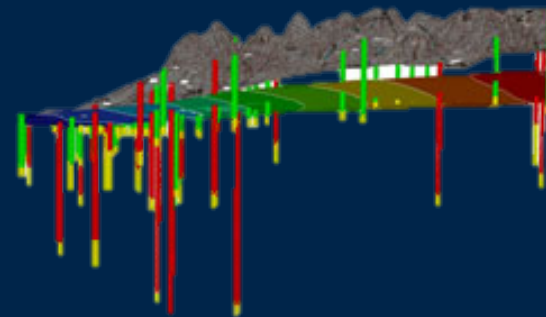
Basin Management Objectives Information Center

# What are some of the IRWM Regions doing to Implement Groundwater Management?

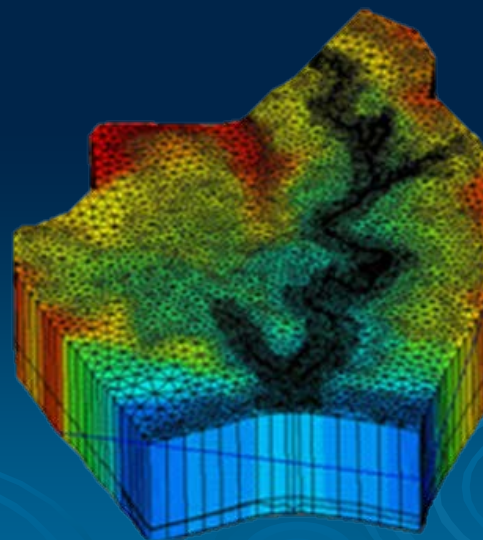
- Groundwater replenishment recharge basins
- Develop numerical groundwater flow model



Recharge Basins



Numerical  
groundwater  
flow models





# California Groundwater Management Plans ...as of August, 2012

## California Plan Coverage

- About 118 Plans
- Plan coverage (All)
  - 31,200 square miles
  - 20% of California\*
  - 82 or 70% of the plans are post SB 1938



\*California = 158,600 square miles



# California Plan Coverage

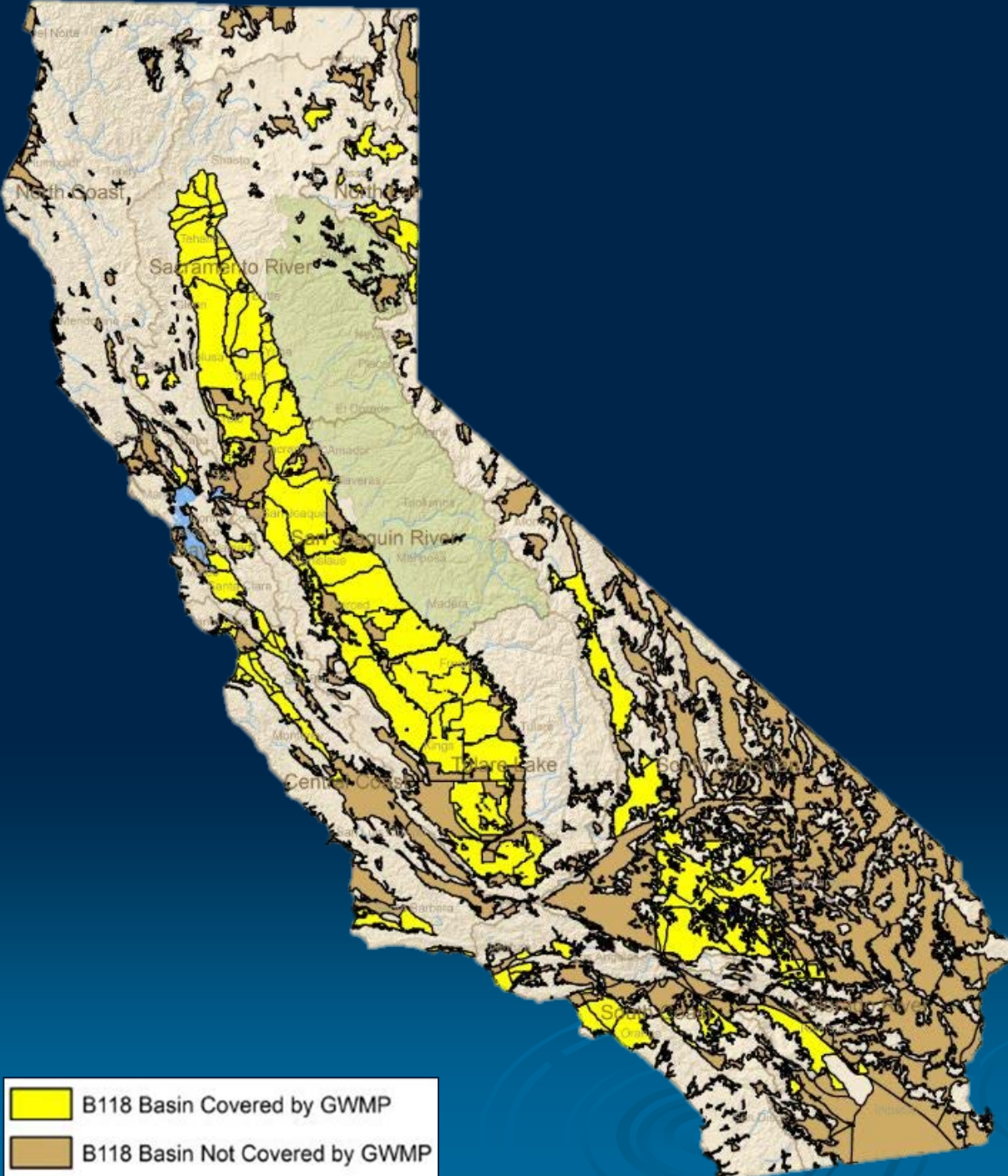
All GWM plans and GW Basins

Groundwater Basins

- 61,900 square miles

Plan Coverage

- Plans - 118
- Coverage  
25,900 square miles  
42% of GW Basin area



# California Plan Coverage

All SB 1938 GWM plans and GW Basins

Groundwater Basins

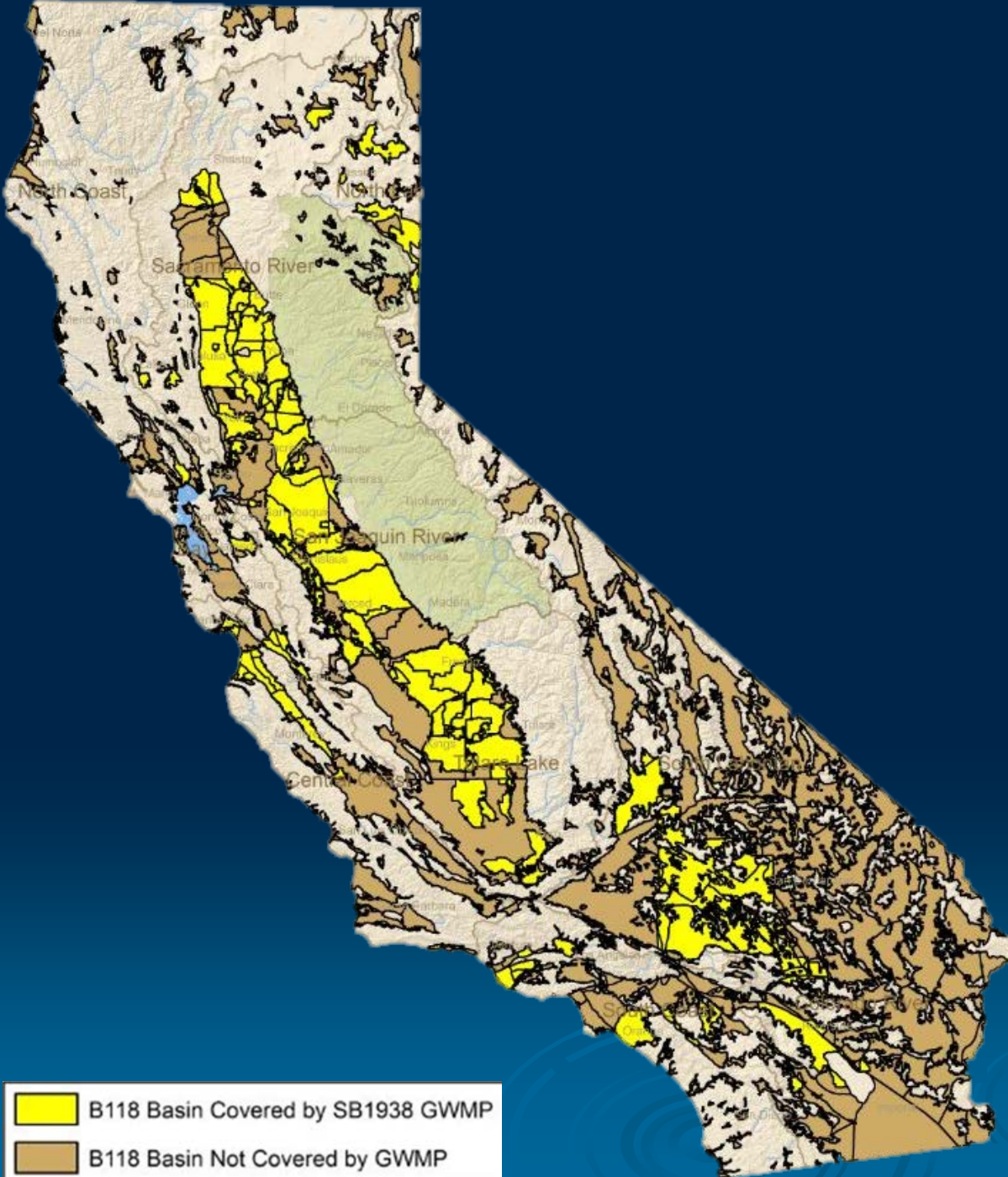
- 61,900 square miles

Post SB 1938 Plan

- Plans – 82 (70%)
- Coverage  
20,100 square miles or  
32% of GW Basin area

Post SB 1938 plan with required components fully addressed

- Plans – 35 (43%)
- Coverage  
10,300 square miles or  
17% of GW Basin area



## Assess plans for SB 1938 components

Required GWMP Components & Subcomponents (CA WC §10753.7)	
<b>1. Basin Management Objectives</b>	<ul style="list-style-type: none"> <li>Monitoring/Management Groundwater Levels</li> <li>Monitoring Groundwater Quality</li> <li>Inelastic Subsidence</li> <li>SW/GW Interaction &amp; Affects to Groundwater Levels &amp; Quality</li> </ul>
<b>2. Agency Cooperation</b>	
<b>3. Map</b>	<ul style="list-style-type: none"> <li>Groundwater basin area</li> <li>Area of local agency</li> <li>Boundaries of other local agencies</li> </ul>
<b>4. Recharge Areas (1/1/2013)</b>	
<b>5. Monitoring Protocols</b>	<ul style="list-style-type: none"> <li>Changes in groundwater levels</li> <li>Changes in groundwater quality</li> <li>Subsidence</li> <li>SW/GW Interaction &amp; Affects to Groundwater Levels &amp; Quality</li> </ul>
<b>6. Compliance with 1-5 for GWMPs Located Outside B118-03 Basins</b>	



## **Voluntary GWMP Components (CA WC §10753.8)**

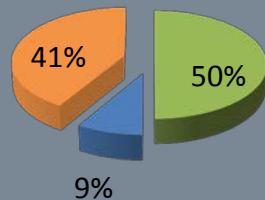
- 1. Control Saline Intrusion**
- 2. Identify & Manage Wellhead Protection & Recharge Areas**
- 3. Regulate Migration of Groundwater Contamination**
- 4. Administer Well Abandonment & Destruction Programs**
- 5. Mitigate Conditions of Overdraft**
- 6. Groundwater Extraction & Replenishment**
- 7. Monitoring of Groundwater Levels and Storage**
- 8. Facilitate Conjunctive Use Operations**
- 9. Identify Well Construction Policies**
- 10. Construction and Operation by the Local Agency of Groundwater Projects**
- 11. Develop Relationships with State & Federal Regulatory Agencies**
- 12. Coordinate with Land Use Planning to Minimize Risks to GW Supply**

## **Suggested GWMP Components (B118-03, Appendix C)**

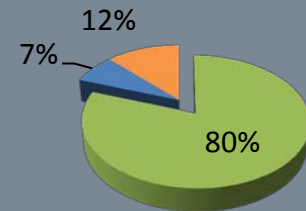
- 1. GWMP Guidance: Establish Advisory Committee to Guide GWMP**
- 2. Management Area: Describe Physical Setting, Aquifer Characteristics, Historical Data, Known Issues, Historical Water Supply & Demands.**
- 3. BMOs, Goals, & Actions**
- 4. Monitoring Plan Description**
- 5. IRWM Planning Coordination**
- 6. GWMP Implementation: Status Reports of Basin Conditions & Mgmt Actions**
- 7. GWMP Evaluation & Assessment:**

# Preliminary Results of Statewide GWMP Assessment

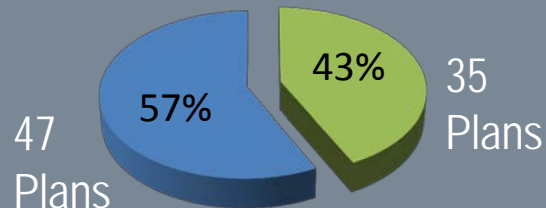
## Basin Management Objectives



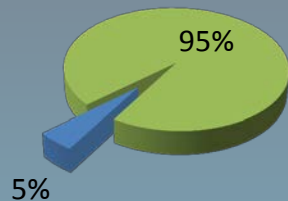
## Map



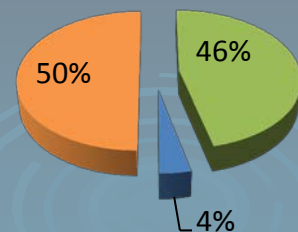
## All requirements, and subrequirements met



## Agency Cooperation



## Monitoring Protocols



Yes (%)  
No (%)  
Partial (%)

## Assessment Highlights - SB 1938 components

CWC § 10753.7 (1) Basin Management Objectives - Surface Water and GW Interaction (~57% addressed)

CWC § 10753.7 (2) Agencies Cooperation (~95% addressed)

CWC § 10753.7 (3) Map - Boundaries of other local agencies (~80% addressed)

CWC § 10753.7 (5) Monitoring Protocols - Surface Water and GW Interaction (~ 55% addressed)



## Assessment Observations and Recommendations

- Very difficult to locate specific details for each SB 1938 required component

Each plan should 'clearly' address each requirement

- Varying interpretations of the California Water Code concerning GW Management

Possibly enhance the CWC to 'clearly' define what is expected

Establish regional workgroups to discuss the requirements and how they can be addressed regionally and locally

## Assessment Observations and Recommendations

- Goals and Objectives often used interchangeably

Refer to DWR Bulletin 118 – 2003

'Create a link between Management Objectives and Goals and Actions of the plan' (pp56-57) and Box K – 'What are Management Objectives' (p61)

- Some plans may not be reflective of current GW management activities and conditions

'Report on Implementation' and 'Evaluate the Plan...' (pp61-62)

## Assessment Observations and Recommendations

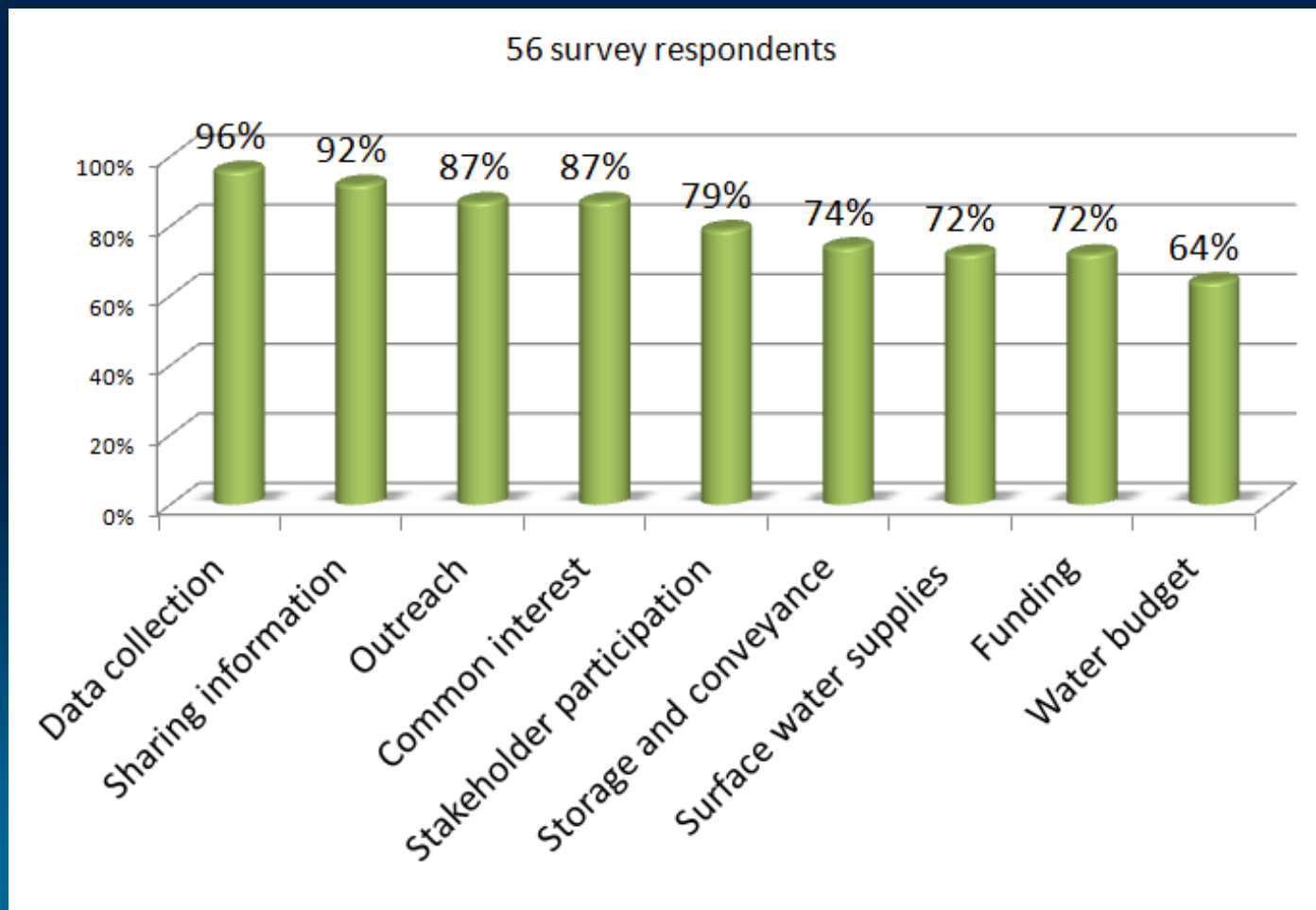
- Implementation details are not typically part of plans

When possible the plan should include What, When and How details. Or if available provide a companion implementation document



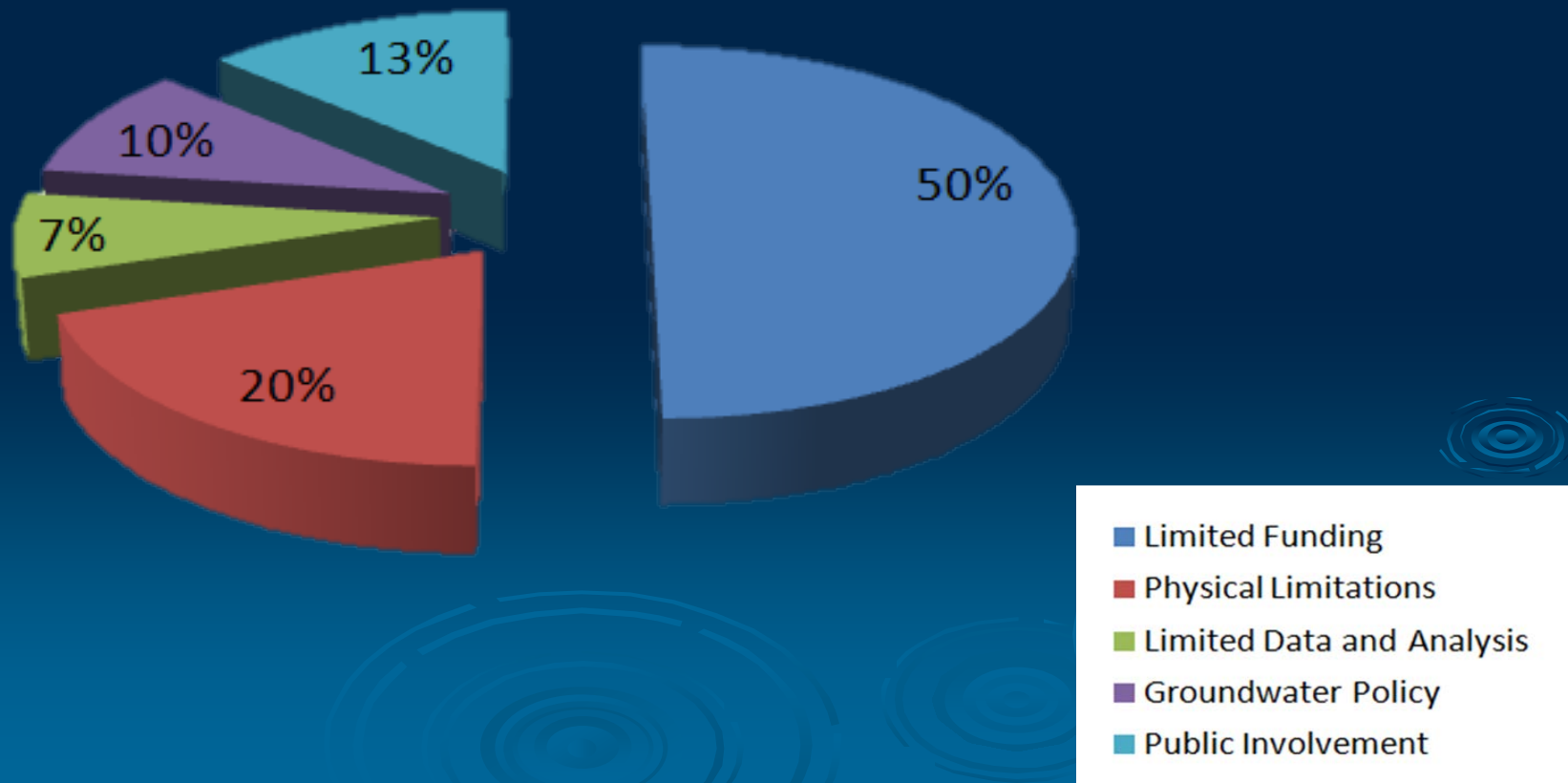
## What's Working?

Key Components that helped agencies with the implementation of their Local Groundwater Management



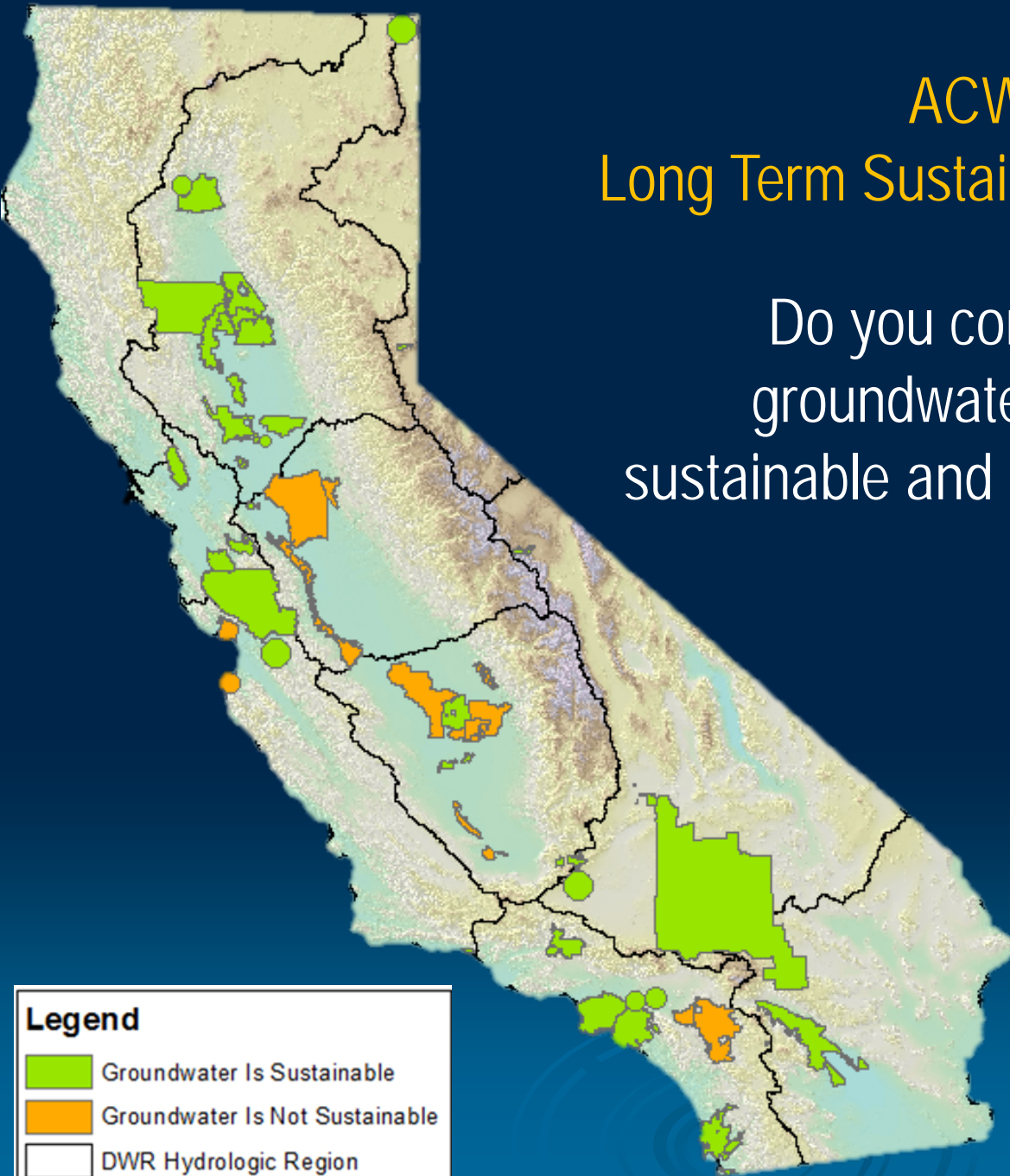
## What are the Challenges?

Factors Limiting the Successful Development of Sustainable Groundwater Management



## ACWA Survey Long Term Sustainability of Groundwater

Do you consider your current groundwater supply to be both sustainable and reliable in the long-term?





*Questions?*